

Executive Summary

Title: Arrival and assemble of the Maritime Prepositioned Force at Sea

Author: LtCol. Walter E. Lundin, USMC

Thesis: The author contends that the arrival and assembly of the MPF at sea will require changes to the MPF's operational capabilities.

Discussion: The Maritime Prepositioned Force (MPF) operation conducted to support the buildup of I MEF during Operation DESERT SHIELD was a success. This operation validated the MPF concept and provided lessons learned that resulted in numerous improvements. One area that still needs addressing is the MPF's vulnerability during its arrival and assembly phase. A vision for eliminating this vulnerability is provided in the U. S. Marine Corps concept for a future MPF titled "Maritime Prepositioned Force 2010 and Beyond." The concept calls for the arrival and assembly of the MPF at sea vice ashore.

The paper first describes how a current day MPF operation is conducted. It then describes how arrival and assembly at sea would take place. The majority of the paper is devoted to identifying and analyzing the capabilities and requirements the MPF(F) needs if it is to be successful. The capabilities are:

- Receiving personnel by air and sea lift
- Providing habitability
- Executing command and control (C2)
- Preparing, issuing, and maintaining equipment
- Issuing supplies
- Staging personnel, supplies, and equipment as task organized units
- Launching units by air and surface to integrate with augmented force
- Adjusting the stability of the ship
- Providing for the ship's protection

Conclusion: Arrival and assembly at sea promises to make MPF operations safer without changing its purpose or essential character. The technology and know how exists today. What remains is the detailed work to identify the MPF(F)'s required capabilities so that the MPF(F) can become a reality.

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 02 MAY 2003		2. REPORT TYPE		3. DATES COVERED 00-00-2003 to 00-00-2003	
4. TITLE AND SUBTITLE Arrival and Assembly of the Maritime Prepositioned Force at Sea				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Marine Corps,School of Advanced Warfighting, Marine Corps University,2076 South Street, Marine Corps Combat Development Command,Quantico,VA,22134-5068				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 21	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

**ARRIVAL AND ASSEMBLY OF the MARITIME
PREPOSITIONED FORCE AT SEA**

by

Walter E. Lundin
Major, USMC
S&SC, SAW Academic Year 2002-2003

Future War Paper submitted to the faculty of the U. S. Marine
Corps in fulfillment of the requirement for

2 May 2003

The Maritime Prepositioned Force (MPF) operation conducted to support the buildup of I MEF during Operation DESERT SHIELD was a success. This operation validated the MPF concept and provided lessons learned that resulted in numerous improvements. One area that still needs addressing is the MPF's vulnerability during its arrival and assembly phase. A vision for eliminating this vulnerability is provided in the U. S. Marine Corps concept for a future MPF titled "Maritime Prepositioned Force 2010 and Beyond."¹ The concept calls for the arrival and assembly of the MPF at sea vice ashore.² Arrival and assembly at sea entails being able to receive forces, issue and prepare equipment, and stage task organized elements for movement ashore while the ships are underway. The author contends that the arrival and assembly of the MPF at sea will require changes to the MPF's operational capabilities.

This paper first describes the basic requirements for conducting an MPF operation. It then describes how arrival and assembly at sea might be conducted. The paper then identifies the capabilities the MPF will need to achieve the vision laid out in the MPF Future concept.

The purpose of an MPF operation is to provide a combat ready Marine Air Ground Task Force (MAGTF), normally brigade size, for employment either as an independent force or to augment an existing force.³ At its simplest, an MPF operation

entails the creation of a combat ready MAGTF by marrying up personnel with forward deployed ship based pre-positioned supplies and equipment in an assembly area in close proximity to where the MAGTF will be employed. The personnel are flown from their home stations to airfields in close proximity to their assembly areas. The prepositioned supplies are moved to the area of operations and off loaded through either a port or beach in the vicinity of the assembly areas. The MAGTF is then formed by marrying the personnel with their equipment and supplies and by conducting the necessary training and maintenance activities needed to create a combat ready MAGTF. These activities constitute the arrival and assembly phase of an MPF operation. The ports, beaches, airfields, training areas, unit assembly areas and road network that connects these areas together are collectively referred to as the Arrival Assembly Area (AAA).⁴

The MPF's current capabilities require arrival and assembly to take place ashore in a permissive environment. This creates several vulnerabilities. The MPF is vulnerable to attack by conventional and unconventional attacks and by weapons of mass destruction. Significant assets must be dedicated to protect the MPF until the MAGTF is combat ready. This responsibility can degrade or negate the MPF's higher headquarters ability to maneuver because it is tied to protecting the MPF operation. Additionally, the limited off load options makes the MPF

operation predictable, affording the enemy opportunity to interdict the arrival and assembly of the MAGTF and its subsequent positioning for employment. Finally, arrival and assembly normally takes up to ten days. It is precisely these vulnerabilities arrival and assembly at sea is intended to overcome.⁵

Arrival and assembly at sea means that all the activities needed to receive and assemble a combat ready MAGTF take place at sea. This includes receiving the personnel through a combination of sea and air lift, drawing and issuing the supplies and equipment, conducting pre-operational equipment checks, conducting pre-combat activities to form units and prepare them for the mission, and, in an augmentation MPF operation, integrating the MPF MAGTF into the augmented force. These requirements necessitate large portions of the MAGTF's personnel being embarked aboard the MPF ships for extended periods of time, all preparations being conducted while the MAGTF is embarked, and for the MPF squadron to maneuver as an integral part of the navy task force/group.

The above requirements will drive the MPF's future operational capabilities. These capabilities should include:

- Receiving personnel by air and sea lift
- Providing habitability
- Executing command and control (C2)

- Preparing, issuing, and maintaining equipment
- Issuing supplies
- Staging personnel, supplies, and equipment as task organized units
- Launching units by air and surface to integrate with augmented force
- Adjusting the stability of the ship
- Providing for the ship's protection

The intent is to describe each of these capabilities in greater detail.⁶

The first required capability is for the MPF ships to be able to receive personnel by either air or sealift while at sea. To receive personnel by airlift will require a landing platform capable of handling multiple vertical take off and landing craft at a time. This leads to the requirement for an air command and control capability able to safely land and launch aircraft and to integrate the ship's air operations with other higher and adjacent air control agencies. To increase flexibility in the positioning of the MPF ships and squadron, the ships will require the capability to fuel aircraft in order to increase flying radius. The individual ship will also require the capability to handle aircraft emergencies to include fire fighting, first aid, and crash and rescue services. To be

viable the individual ship will also require the capability to support maintenance of broken aircraft. All these capabilities will drive associated requirements for trained personnel, specialized equipment, and supplies.

To receive personnel by sealift will require the capability to transfer personnel from surface craft to the MPF ship. Because the capability of the craft transporting the personnel to the MPF squadron will vary, the transfer capability will need to reside with the MPF ships. This includes a requirement to create a surface level pier to which lighterage can dock. It will also create a requirement for the MPF ship to provide the lighterage, since there will be no guarantee that the transporting ship will possess them. Another requirement will be to provide a means to transfer personnel from a transport ship that lacks a means to off-load personnel at sea to the lighterage. A final requirement will be the ability to conduct transfer operations in up to sea state 3 conditions.

Once the troops are embarked the MPF ships need to provide the capability for habitation. This includes the requirement to accommodate the majority of personnel for a brigade on the MPF squadron's ship for extended periods of time.⁷ Ideally, all 12,000 would not be embarked at one time. Most of the troops would quickly pass through the MPF ships and be employed ashore. Additionally, some support personnel would move to the ships

after the first wave of combat and combat support had completed their assembly and been committed ashore. However, during the height of arrival and assembly there is the potential for up to 8,000 personnel to be embarked aboard the MPF squadron⁸.

To provide habitability each ship will need to provide billeting, messing, and hygiene facilities. Additionally, unit headquarters will require office space to administer the force. Each ship will also require medical facilities to stabilize urgent and priority casualties for evacuation and to provide preventative medicine and routine medical care to embarked forces. The embarked units could provide the medical personnel, and the supplies and equipment could be drawn from the pre-positioned supplies and equipment. The actual medical facilities will need to be incorporated into the MPF ship's design.

Arrival and assembly at sea will also require a capability for command and control, both to integrate the MPF ships into the navy architecture and for the MAGTF to command and control its forces.

Because the arrival and assembly will take several days, the MPF squadron will require the capability to maneuver in conjunction with the other navy assets in the area of operation. The navy task force/group will need to position the MPF ships to protect them from maritime and air threats. This capability

will require the MPF ships to possess additional communications assets, specialized automated data processing equipment (ADP&E) and programs, and antennas. These command and control systems will require trained personnel, either U. S. Navy or merchant marine, to man them. Finally, the ship's officers and crew will require training in how to maneuver their ship tactically as part of a navy task force/group.

The embarked MAGTF will have its own unique requirement for a command and control capability. The various commanders and their staffs will need to supervise the arrival and assembly of their force, they will have to conduct mission planning and participate in higher and adjacent headquarters' planning and rehearsals, and they will have to manage the movement of their forces between ships and outside the MPF squadron. These requirements will create the need for dedicated planning spaces, communications and ADP&E, and antennas. The communications equipment, ADP&E, and planning support tools could be provided from the pre-positioned equipment, brought aboard by the MAGTF personnel, or provided by the ship. The planning spaces, intra and inter ship network, power sources, classified materials spaces, and antennas will need to be incorporated into the ship's design.

The capability to prepare the pre-positioned equipment for combat will present a significant challenge. The first

requirement will be for space, always at a premium on ship. The Marines will need to gain access to the equipment to assemble it, conduct pre-operation's checks, and upload fuel and ammunition. Every piece of equipment the Marine Corps designs in the future and modifies will need to have the ability to conduct its pre-operational checks within the confines of the MPF ship. This includes the capability to battle sight zero the weapons without firing a round or utilizing the standoff distances associated with today's weapons systems. There will also be requirement for maintenance spaces to repair defective equipment. Without the ability to confirm the equipment is combat ready prior to movement ashore and to fix problems the advantage of arrival and assembly would be negated.

Once the equipment is combat ready the MAGTF must have ready the capability to package the personnel, equipment, and supplies into task organized elements/units based on tactical tasks. This capability will require space. This includes space to move equipment and supplies, either under their own mobility or using material handling equipment, from storage to a staging area, without causing major dislocation of unneeded material. There will also be a requirement for space to stage the task-organized element/unit in landing serials prior to movement. These requirements will also generate the requirement for the

associated command and control to manage the movements and to maximize the use of available space.

When the purpose of the MPF operation is to augment an existing force, the assembly of the MAGTF is not complete until the MAGTF is integrated into the augmented force. Most of the integration will occur in command and control, which is covered in an earlier section of this paper. However, the MPF will also require the capability to move elements/units from the MPF ships to shore or to other vessels, either another MPF ship or an amphibious ship. Most of the personnel and supplies could be moved by air but much of the equipment would need to be moved by sea. Therefore, each MPF ship will need the capability to launch elements/units by both sea and air. This capability includes moving supplies, equipment, and personnel to staging areas; loading them onto the movement means; and launching the associated craft.

The movement of equipment and supplies adds additional requirements. First, the ship's design will need to accommodate moving supplies and equipment from their storage and preparation sites to either the aircraft landing pad or the surface craft loading area, without degrading other ongoing activities. This includes moving equipment as big and cumbersome as artillery pieces and tanks. Next, specialized equipment and trained personnel will be needed to conduct the safe loading and

securing of the items to be moved. Finally, the movement craft will need to be launched and maneuvered safely either ashore or to link up with another ship.

The Advanced Assault Amphibian Vehicle (AAAV) will create another required capability. The MPF ships that store the AAAV will have the requirement to launch the AAAV directly into the water where it would proceed under its own power. This would drive a requirement for either a well deck or, at a minimum, a ramp from which the AAAVs could be launched and recovered.

The receiving of personnel and the staging of task organized elements/units and their movement off of the MPF ship will cause the center of gravity of the ship to change. The changing of the ship's center of gravity could threaten its ship's stability. This will require the MPF ship be capable of monitoring its stability, computing solutions, and adjusting its balance to maintain stability. Adjusting the ship's stability will need to take place concurrent with and without degrading arrival and assembly operations.

Arrival and assembly at sea will reduce the MPF's vulnerability to conventional and unconventional land attack, but it will increase its vulnerability to maritime and air attacks. Instead of quickly off loading supplies and equipment then exiting the area of operations the MPF squadron and ships will be required to remain in the area for extended periods of

time. This will provide the enemy opportunity to locate and attack them. The MPF will need the capability to protect itself, to offset this vulnerability.

They will gain most of their protection by integrating into the navy task force/group. The navy's combatant vessels will handle detection and defeat of surface, subsurface, and air attack. The MPF squadron and ships will require the capability to maneuver away from the threat in accordance with direction from the navy task force/group. This capability reinforces the requirement described above for maneuvering with a navy task force/group.

However, the MPF ship cannot rely on other assets for all its protection. Each ship, at a minimum, will require the capabilities to fight fires, conduct damage control, and make essential repairs. The systems necessary to accomplish these requirements will need to be designed into the ship.

The personnel to man these systems will be a more controversial issue. Merchant ships usually lack the personnel to accomplish these tasks in a combat environment, and the navy may be reluctant to provide the personnel, given their manning difficulties. Embarked Marines could be a potential source of manpower. However, this would cause other problems. First, the Marines would have to be trained in the necessary skills to perform these tasks on ship. Second, assigning Marines to

these tasks would mean they were not available for their primary duties, resulting in the requirement for more Marines to be embarked or a degradation in the MAGTF's combat readiness. Additional merchant marines could be hired for each ship. However, this would be an expensive option since, for the majority of time, these personnel would remain idle. New technology has the potential to reduce though not eliminate the manning and training requirements for the systems providing these capabilities.

The capabilities identified above will require significant changes to the MPF. Current MPF operations are designed for bulk offload of supplies and equipment and for arrival and assembly ashore. These requirements are evident in the design and loading of the MPF ships, the design of the pre-positioned equipment, and in the number and training of personnel. The operational requirements of the MPF must be changed to create an effective at sea arrival and assembly.

Many of the changes will need to take place in the MPF ship design. Foremost, will be the requirement for space. Each ship will require space for habitation; preparing equipment; moving and staging personnel, supplies, and equipment; and dedicated planning and command and control areas. The challenge will be to create the space while simultaneously keeping the ship within reasonable size and cost.

Changes in required capabilities are not limited to the MPF ships. Every piece of equipment on the MPF ships must be designed to perform its pre-combat preparations within the confines of the ship. These checks must be 100% reliable to ensure the Marines have confidence in their equipment as they go into combat. The equipment must also be designed to be repaired in the confined spaces when a problem is identified.

All these requirements will have ramifications for personnel. The MPF squadron and ship's will either need its personnel trained to conduct a host of new tasks or they will need to be augmented by either navy or Marine personnel. If the ship's crew assumes the tasks it means an increase in crew size and personnel costs. The crew will also need to be trained in these skills. If either navy or Marine personnel augment the ship, there will still be a requirement for training. In addition, the augmentation of the crew by the military members of the MPF would create a requirement for more military personnel. If more personnel are not attached then there would probably be a degradation in the MAGTF's combat capability when personnel are multi tasked.

The capability to arrive and assemble a MAGTF at sea is feasible. The technology exists or can be easily developed from today's capabilities. The MPF proved itself versatile and useful in such diverse settings as war with Iraq and military

operations other than war in Somalia. The Marine Corps has provided a clear concept on how a future MPF would enhance its expeditionary operations and the nation's strategic options in its "Expeditionary Maneuver Warfare" and "MPF 2010 and Beyond" concepts.⁹ Finally, the MPF(F) provides the Marine Corps a hedge against the U. S. Navy further degrading its amphibious capability.

There are some disadvantages to developing MPF(F). Foremost is the cost. A close second is resistance from elements within the U. S. Navy. Best estimates place each MPF(F) ship at 1 Billion dollars.¹⁰ Added to this is the expense attendant to making every piece of equipment MPF(F) compatible and any additional personnel expenses, if any, over today's manning levels of MPF ships.

The expected costs also influences resistance from elements within the U. S. Navy. There is a belief that the defense budget will bear only so much for new ship construction and therefore the MPF(F) is a threat to other types of navy ships, especially aircraft carriers. This concern is exacerbated by the MPF(F)'s aviation capability. There is a fear that the MPF(F) will be compared to an aircraft carrier by the uniformed or ignorant and will lead to a call for fewer carriers. The concerned elements counter the MPF(F) by attacking its funding

and by threatening to equate MP(F) ships to amphibious shipping, thereby cutting the number of true amphibious ships.

The U. S. Marine Corps is wary of these agendas and works hard to ensure the MPF(F)'s capabilities are not seen as a threat to carriers and to clearly explain the why the MPF(F) capability is needed. Additionally, MP(F) proponents are looking at a number of options to meet the requirement while limiting the cost. Options include spreading the capabilities across the entire squadron, limiting the aviation capability, and exploring new ship versus modifications to existing ships, to name a few.¹¹

Arrival and assembly at sea promises to make MPF operations safer without changing its purpose or essential character. The technology and know how exists today. What remains is the detailed work to identify the MPF(F)'s required capabilities so that the MPF(F) can become a reality.

¹ Headquarters, United States Marine Corps, United States Marine Corps Warfighting Concepts for the 21st Century, (Quantico, VA: Marine Corps Combat Development Command, 1996), Ch. 3.

² Ibid., III-5.

³ Department of the Navy and the United States Marine Corps, NWP 22-10 and FMFM 1-5, Maritime Prepositioning Force Operations, (Norfolk, VA: Naval Warfare Publication, 1993), p. 1-1.

⁴ Ibid., pp. 8-1 through 8-7.

⁵ Marine Corps Combat Development Command, United States Marine Corps Warfighting Concepts for the 21st Century brief, (Quantico, VA: Marine Corps Combat Development Command, 2000). Vulnerabilities were part of speaker notes on slides describing the "Maritime Prepositioning Force 2010 and Beyond" warfighting concept.

⁶ Marine Corps Combat Development Command, "Description of MPF(F) Operational Capabilities", MPF Futures Team, (Quantico, VA: Marine Corps Combat Development Command, draft dated 16 September 2002). The operational capabilities in this paper are based on the MPF Futures team's document

titled "Description of MPF(F) Operational Capabilities." This document itself is preceded and based on a number of similar efforts. In particular, the Operational Maneuver from the Sea Capabilities list developed by a MCCDC lead working group during 1999 and 2000. The author was both a member and one of the facilitators of this group.

⁷ The Center for Naval Analysis (CNA) sets the requirement for the MPF(F) squadron to billet 8,000 embarked troops in their ongoing Analysis of Alternatives (AOA). Center for Naval Analysis, "MPF(F) Background and Analysis of Alternatives Overview", Mr. R. M. Sounders, Power point presentation dated 28 February 2003, slide 3.

⁸ Ibid., slide 3.

⁹ The Expeditionary Maneuver Warfare Concept lays out the U. S. Marine Corps vision of how it will employ itself in the future and serves as a foundation for supporting concepts such as "Maritime Prepositioning Force 2010 and Beyond." Headquarters United States Marine Corps, "Expeditionary Maneuver Warfare," (Quantico, VA: Marine Corps Association, February 2002).

¹⁰ A formal cost benefit analysis has not yet been completed. LtCol Patrick O'Bryan provided information on cost. LtCol. O'Bryan heads the U. S. Marine Corps MPF Futures team. E-mail from LtCol. O'Bryan to LtCol. Walter E. Lundin dated 25 February 2003.

¹¹, "MPF(F) Background and Analysis of Alternatives Overview", slides 8 and 9.

Bibliography

Center for Naval Analysis. "MPF(F) Background and Analysis of Alternatives." Mr. R. M. Sounders. Power Point Brief dated 28 February 2003.

E-mail from LtCol. O'Bryan to LtCol. Walter E. Lundin dated 25 February 2003.

Headquarters United States Marine Corps. "Expeditionary Maneuver Warfare." Quantico, Virginia: Marine Corps Association, February 2002.

Headquarters, United States Marine Corps. United States Marine Corps Warfighting Concepts for the 21st Century. Quantico, Virginia: Marine Corps Combat Development Command, 1996.

Department of the Navy and the U. S. Marine Corps. NWP 22-10 and FMFM 1-5. Maritime Prepositioning Force Operations. Norfolk, VA: Naval Warfare Publication, 1993.

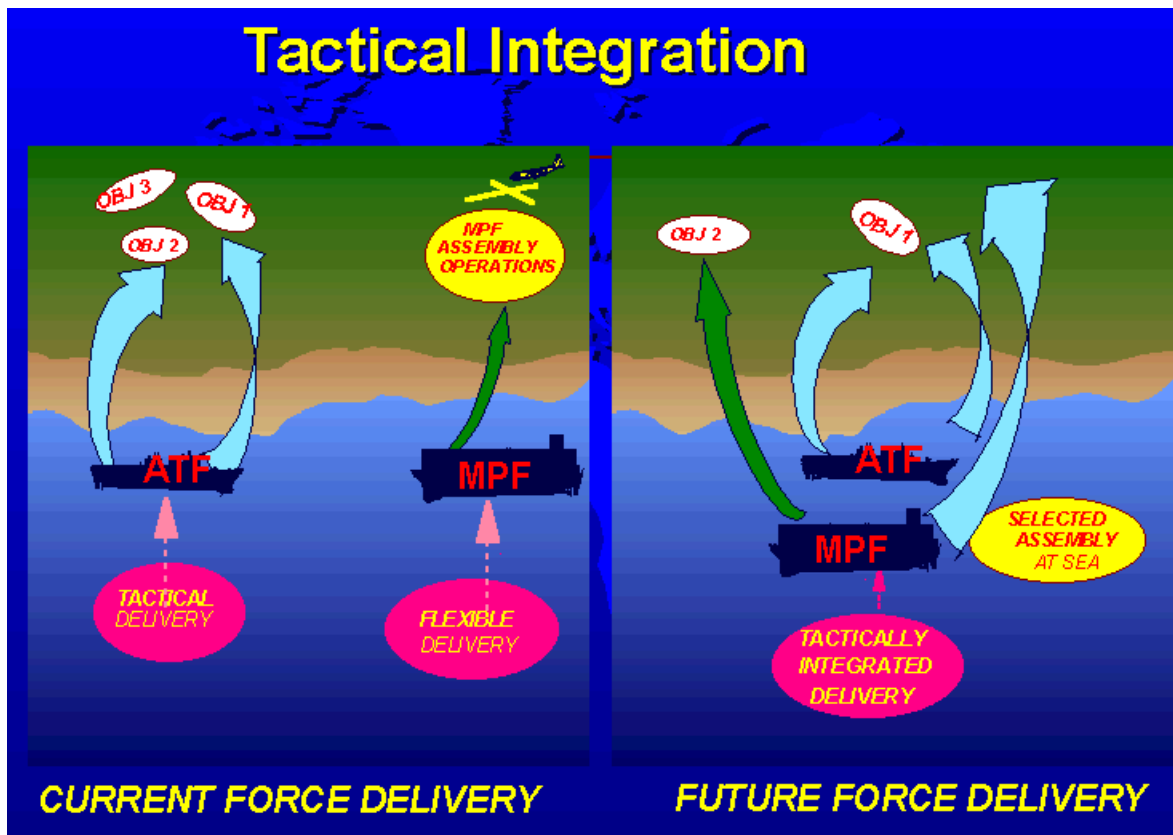
Headquarters, Marine Corps Combat Development Command. "Operational Maneuver From the Sea Capabilities List. Document. 2000.

Headquarters, Marine Corps Combat Development Command, MPF(F) Futures Team. "MPF(F), the Seabase and Emerging Naval Operational Concepts: A Coordinated and Integrated Approach. Brief.

Headquarters, Marine Corps Combat Development Command, MPF(F) Futures Team. "Description of MPF(F) Operational Capabilities." Document. Draft dated 16 September 2002.

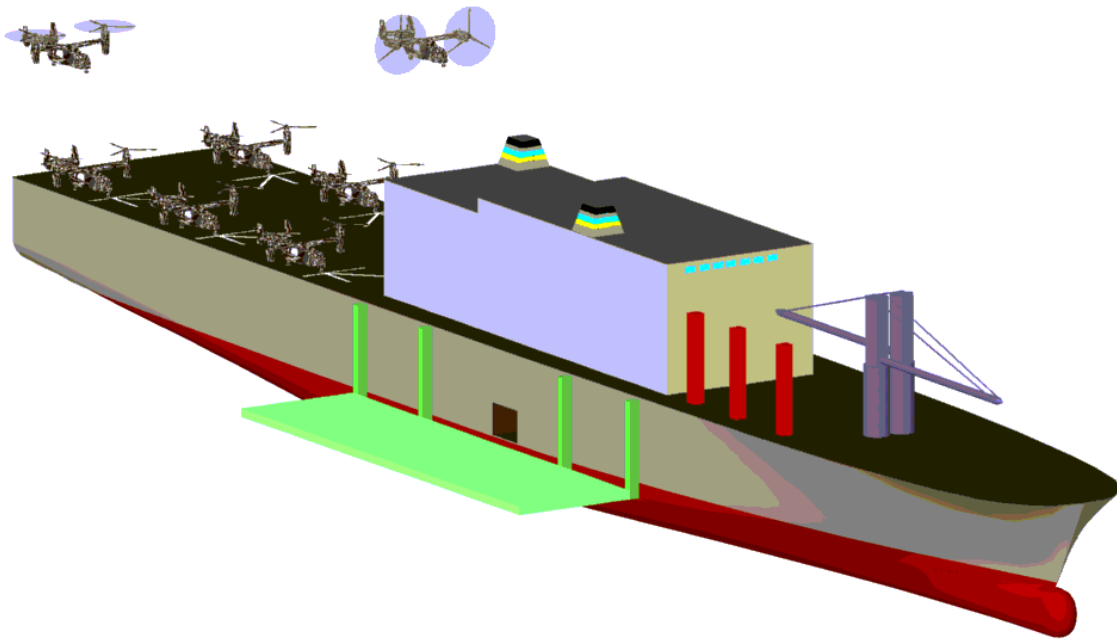
Interviews with members of the Headquarters, Marine Corps Combat Development Command, MPF(F) Futures Team.

Graphic #1 MPF(F)- Augmented and Independent Operations



Headquarters, United States Marine Corps, United States Marine Corps Warfighting Concepts for the 21st Century, (Quantico, VA: Marine Corps Combat Development Command, 1996), p. III-7.

Graphic #2. Conceptual design of MPF(F) Ship



**Provided by LtCol. Patrick O'Bryan, head MPF(F) Team, Future's
Division, Expeditionary Force Development Directorate, Marine Corps
Combat Development Command**